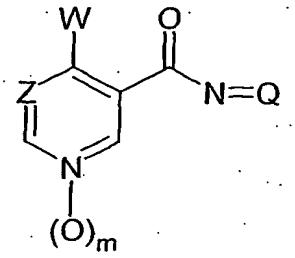
CLAIMS

1. A compound of the formula (I):



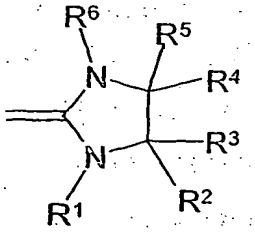
(I)

wherein:

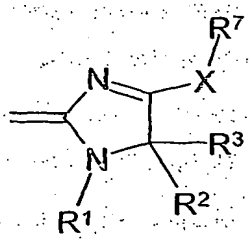
W is $(C_1$-$C_4)$haloalkyl;

Z is CH or N;

=Q is a group of formula (A) or (B):



(A)



(B)

R^1 and R^6 are each independently H, $(C_1$-$C_8)$alkyl, $(C_3$-$C_6)$alkenyl, $(C_3$-$C_6)$alkynyl, $(C_1$-$C_6)$alkoxy, $(C_3$-$C_6)$alkenyloxy, $(C_3$-$C_6)$alkynyloxy, $(C_1$-$C_6)$alkylamino, di-$(C_1$-$C_6)$alkylamino, $NHCO(C_1$-$C_6)$alkyl, $NHSO_2(C_1$-$C_6)$alkyl, $CO(C_1$-$C_6)$alkyl or $SO_2(C_1$-$C_6)$alkyl which last twelve mentioned groups are unsubstituted or substituted by one or more R^8 groups; or are $(C_3$-$C_8)$cycloalkyl or $(C_3$-$C_8)$cycloalkyl-$(C_1$-$C_6)$alkyl- which cycloalkyl radicals are unsubstituted or substituted by one or more $(C_1$-$C_6)$alkyl, $(C_1$-$C_6)$haloalkyl or R^8 groups; or are $-(CR^9R^{10})_pR^{11}$, $-(CR^9R^{10})_p$heterocyclyl, OH, SO_2R^{11}, NH_2, $NHCOR^{11}$, $NH(C_3$-$C_8)$cycloalkyl, $NH(CR^9R^{10})_sR^{11}$, $O(CR^9R^{10})_rR^{11}$, $-(CR^9R^{10})CO_2CH_2R^{11}$, $O(CH_2)_r$heterocyclyl, $N=C[(C_1$-$C_6)alkyl]_2$, COR^{11a} or CO-heterocyclyl; or are $(C_3$-$C_6)$alkenyl substituted by R^{11a};

R^2, R^3, R^4 and R^5 are each independently H, $(C_1$-$C_8)$alkyl, $(C_2$-$C_6)$alkenyl or $(C_2$-$C_6)$alkynyl, which last three mentioned groups are unsubstituted or substituted by one or more R^8 groups; or are $(C_3$-$C_8)$cycloalkyl or $(C_3$-$C_8)$cycloalkyl-$(C_1$-$C_6)$alkyl-

which cycloalkyl radicals are unsubstituted or substituted by one or more (C_1-C_6)alkyl, (C_1-C_6)haloalkyl or R^8 groups; or are (C_1-C_6)alkyl-SH, -(CR^9R^{10})$_p$$R^{11}$, -($CR^9R^{10}$)$_p$heterocyclyl or O($CH_2$)$_r$$R^{11}$;

or R^2 and R^3, or R^4 and R^5 together with the respective attached carbon atom form a carbonyl or thiocarbonyl group or a (C_3-C_8)cycloalkyl ring; or an imino group which is unsubstituted or substituted by (C_1-C_6)alkyl, CO(C_1-C_6)alkyl or R^{11a};

R^7 is (C_3-C_6)alkenyl, (C_3-C_6)alkynyl, -(CR^9R^{10})$_p$$R^{11}$, -($CR^9R^{10}$)$_p$heterocyclyl, CO($C_1$-$C_6$)alkyl or a ($C_3$-$C_8$)cycloalkyl ring; or ($C_1$-$C_8$)alkyl unsubstituted or substituted by one or more radicals selected from halogen and –OC(=O)-(C_1-C_4)alkyl;

R^8 is halogen, (C_1-C_6)alkoxy, (C_1-C_6)haloalkoxy, S(O)$_n$$R^{12}$, CN, CO_2(C_1-C_6)alkyl, CO_2H, NO_2, OH, amino, (C_1-C_6)alkylamino, di-(C_1-C_6)alkylamino, carbamoyl, (C_1-C_6)-alkylcarbamoyl, di-(C_1-C_6)-alkylcarbamoyl, CH[O(C_1-C_6)alkyl]$_2$, (C_3-C_6)alkenyloxy, (C_3-C_6)alkynyloxy or O(CH_2)$_r$$R^{11}$;

R^9 and R^{10} are each independently H, (C_1-C_6)alkyl or (C_1-C_6)haloalkyl;

R^{11} is aryl unsubstituted or substituted by one or more radicals selected from the group consisting of (C_1-C_6)alkyl, (C_1-C_6)haloalkyl, (C_2-C_6)alkenyl, (C_2-C_6)alkynyl, (C_3-C_8)cycloalkyl, -(CH_2)$_u$$R^{11a}$, heterocyclyl, halogen, (C_1-C_6)alkoxy, (C_1-C_6)haloalkoxy, S(O)$_n$$R^{12}$, CN, CO_2(C_1-C_6)alkyl, NO_2, amino, (C_1-C_6)alkylamino, di-(C_1-C_6)alkylamino and CO(C_1-C_6)alkyl;

R^{11a} is aryl unsubstituted or substituted by one or more radicals selected from the group consisting of (C_1-C_6)alkyl, (C_1-C_6)haloalkyl, halogen, (C_1-C_6)alkoxy, (C_1-C_6)haloalkoxy, S(O)$_n$$R^{12}$, CN, CO_2(C_1-C_6)alkyl, CO_2H, NO_2, OH, amino, (C_1-C_6)alkylamino and di-(C_1-C_6)alkylamino;

R^{12} is (C_1-C_6)alkyl or (C_1-C_6)haloalkyl;

X is O, S, NR^{13} or NOR^{13};

R^{13} is H, (C_1-C_8)alkyl, (C_3-C_6)alkenyl, (C_3-C_6)alkynyl or (C_3-C_8)cycloalkyl which last four mentioned groups are unsubstituted or substituted by one or more R^8 groups; or is (C_3-C_8)cycloalkyl-(C_1-C_6)alkyl- which cycloalkyl is unsubstituted or substituted by one or more (C_1-C_6)alkyl, (C_1-C_6)haloalkyl or R^8 groups; or is -(CR^9R^{10})$_p$$R^{11}$ or -(CR^9R^{10})$_p$heterocyclyl;

m, s and u are each independently 0 or 1;

n is 0, 1 or 2;

p is 0, 1, 2 or 3;

r is 0 or an integer from 1 to 6; and each heterocyclyl in the above mentioned radicals is independently a heterocyclic radical having 3 to 7 ring atoms and 1 to 4 hetero atoms selected from N, O and S, and is unsubstituted or substituted by one or more radicals selected from the group consisting of (C_1-C_6)alkyl, (C_1-C_6)haloalkyl, (C_2-C_6)alkenyl, (C_2-C_6)alkynyl, $-(CH_2)_uR^{11a}$, halogen, (C_1-C_6)alkoxy, (C_1-C_6)haloalkoxy, $S(O)_nR^{12}$, CN, $CO_2(C_1-C_6)$alkyl, NO_2, OH, amino, (C_1-C_6)alkylamino and di-(C_1-C_6)alkylamino;

or a pesticidally acceptable salt thereof.

2. A compound or a salt thereof as claimed in claim 1, wherein W is CF_3.

3. A compound or a salt thereof as claimed in claim 1 or 2, wherein Z is CH.

4. A compound or a salt thereof as claimed in claim 1, 2 or 3, wherein R^1 and R^6 are each independently H, (C_1-C_8)alkyl, (C_3-C_6)alkenyl, $CO(C_1-C_6)$alkyl or $SO_2(C_1-C_6)$alkyl; or are $-(CR^9R^{10})_pR^{11}$.

5. A compound or a salt thereof as claimed in any one of claims 1 to 4, wherein R^2, R^3, R^4 and R^5 are each independently H, (C_1-C_8)alkyl, (C_3-C_6)alkenyl, (C_3-C_6)alkynyl, $-(CR^9R^{10})_pR^{11}$, $-(CR^9R^{10})_p$heterocyclyl or $O(CH_2)_rR^{11}$; or R^2 and R^3 together with the attached carbon atom form a carbonyl or thiocarbonyl group, or an imino group which is unsubstituted or substituted by (C_1-C_6)alkyl, $CO(C_1-C_6)$alkyl or R^{11a}; or R^2 and R^3, or R^4 and R^5 together with the respective attached carbon atom form a (C_3-C_8)cycloalkyl ring.

6. A compound or a salt thereof as claimed in any one of claims 1 to 5 wherein:

W is CF_3;

Z is CH;

R^1 and R^6 are each independently H, (C_1-C_8)alkyl, (C_3-C_6)alkenyl, $CO(C_1-C_6)$alkyl or $SO_2(C_1-C_6)$alkyl; or are $-(CR^9R^{10})_pR^{11}$;

R^2, R^3, R^4 and R^5 are each independently H, $(C_1$-$C_8)$alkyl, $(C_3$-$C_6)$alkenyl, $(C_3$-$C_6)$alkynyl, $-(CR^9R^{10})_pR^{11}$, $-(CR^9R^{10})_p$heterocyclyl or $O(CH_2)_rR^{11}$; or R^2 and R^3 together with the attached carbon atom form a carbonyl or thiocarbonyl group, or an imino group which is unsubstituted or substituted by $(C_1$-$C_6)$alkyl, $CO(C_1$-$C_6)$alkyl or R^{11a}; or R^2 and R^3, or R^4 and R^5 together with the respective attached carbon atom form a $(C_3$-$C_8)$cycloalkyl ring;

R^7 is $(C_1$-$C_8)$alkyl, $(C_3$-$C_6)$alkenyl, $(C_3$-$C_6)$alkynyl, $-(CR^9R^{10})_pR^{11}$ or $-(CR^9R^{10})_p$heterocyclyl;

R^8 is $(C_1$-$C_4)$alkoxy or OH;

R^9 and R^{10} are each independently H, $(C_1$-$C_4)$alkyl or $(C_1$-$C_4)$haloalkyl;

R^{11} is phenyl unsubstituted or substituted by one or more radicals selected from the group consisting of $(C_1$-$C_4)$alkyl, $(C_1$-$C_4)$haloalkyl, $(C_2$-$C_4)$alkenyl, $(C_2$-$C_4)$alkynyl, $(C_3$-$C_6)$cycloalkyl, $-(CH_2)_uR^{11a}$, heterocyclyl, halogen, $(C_1$-$C_4)$alkoxy, $(C_1$-$C_4)$haloalkoxy, $S(O)_nR^{12}$, CN, $CO_2(C_1$-$C_4)$alkyl, NO_2, amino, $(C_1$-$C_4)$alkylamino and di-$(C_1$-$C_4)$alkylamino; (more preferably R^{11} is phenyl unsubstituted or substituted by one or more radicals selected from the group consisting of $(C_1$-$C_4)$alkyl, halogen, $(C_1$-$C_4)$alkoxy, NO_2 and amino);

R^{11a} is phenyl unsubstituted or substituted by one or more radicals selected from the group consisting of $(C_1$-$C_4)$alkyl, $(C_1$-$C_4)$haloalkyl, halogen, $(C_1$-$C_4)$alkoxy, $(C_1$-$C_4)$haloalkoxy, $S(O)_nR^{12}$, CN, $CO_2(C_1$-$C_4)$alkyl, CO_2H, NO_2, OH, amino, $(C_1$-$C_4)$alkylamino and di-$(C_1$-$C_4)$alkylamino;

R^{12} is $(C_1$-$C_4)$alkyl or $(C_1$-$C_4)$haloalkyl;

X is O or S;

m is 0;

p, r, s and u are each independently 0 or 1; and

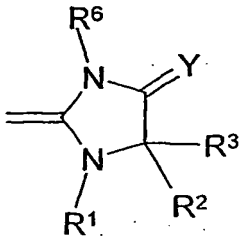
each heterocyclyl in the above mentioned radicals is independently a heterocyclic radical having 3 to 7 ring atoms and 1 to 4 hetero atoms selected from N, O and S.

7. A compound or a salt thereof as claimed in any one of claims 1 to 6 wherein:

W is CF_3;

Z is CH;

=Q is a group of formula (A1):



(A1)

R^1 and R^6 are each independently H, $(C_1\text{-}C_8)$alkyl, $(C_3\text{-}C_6)$alkenyl, $CO(C_1\text{-}C_6)$alkyl or $SO_2(C_1\text{-}C_6)$alkyl; or are $-(CR^9R^{10})_pR^{11}$;

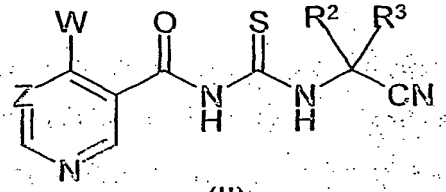
R^2 and R^3 are each independently H, $(C_1\text{-}C_8)$alkyl, $(C_3\text{-}C_6)$alkenyl, $(C_3\text{-}C_6)$alkynyl, $-(CR^9R^{10})_pR^{11}$, $-(CR^9R^{10})_p$heterocyclyl or $O(CH_2)_rR^{11}$;

Y is O or S; and

heterocyclyl is a heterocyclic radical having 3 to 7 ring atoms and 1 to 4 hetero atoms selected from N, O and S.

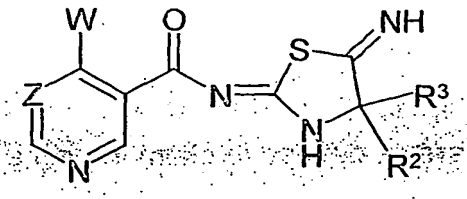
8. A process for the preparation of a compound of formula (I) or a salt thereof as defined in any one of claims 1 to 7, which process comprises:

a) where =Q is a formula (A), R^2 and R^3 are as defined in claim 1 excluding where together with the attached carbon atom they form a carbonyl, thiocarbonyl or imino group, R^4 and R^5 together with the attached carbon atom form a thiocarbonyl group, R^1 and R^6 are each a hydrogen atom and m is zero, the cyclisation-rearrangement reaction of a compound of formula (II):



(II)

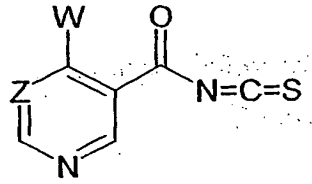
wherein W and Z are as defined in claim 1, R^2 and R^3 are as defined in claim 1 excluding where together with the attached carbon atom they form a carbonyl, thiocarbonyl or imino group, by heating and/or reaction in the presence of a base, via an intermediate of formula (III):



(III)

wherein W, Z, R^2 and R^3 are as defined in claim 1, which rearranges to the compound of formula (I); or

b) where W and Z are as defined in claim 1, =Q is a formula (A), R^2 and R^3 are as defined in claim 1 excluding where they form a carbonyl, thiocarbonyl or imino group, R^4 and R^5 together with the attached carbon atom form a thiocarbonyl group, R^1 and R^6 are each a hydrogen atom and m is zero, reacting a compound of formula (IV):



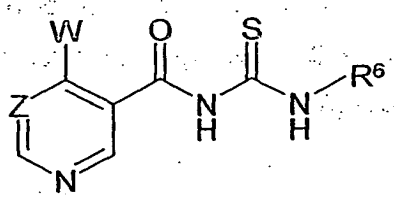
(IV)

wherein W and Z are as defined in claim 1, with a compound of formula (V):

$H_2NCR^2(R^3)CN$ (V)

wherein R^2 and R^3 are as defined in claim 1 excluding where together with the attached carbon atom they form a carbonyl, thiocarbonyl or imino group, to give the corresponding compound of formula (II), followed by cyclisation and rearrangement as described in process a) above; or

c) where =Q is a formula (A), R^1 is a hydrogen atom, R^2 and R^3 are as defined in claim 1 excluding where together with the attached carbon atom they form a carbonyl, thiocarbonyl or imino group, R^4 and R^5 together with the attached carbon atom form a carbonyl group, W, Z and R^6 are as defined in claim 1 and m is zero, reacting a compound of formula (VI):

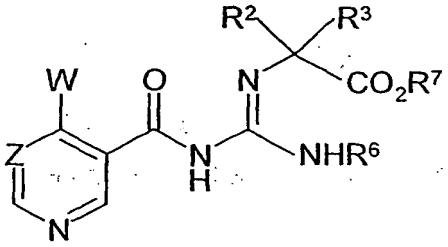


(VI)

wherein W, Z and R^6 are as defined in claim 1, with a compound of formula (VII):

$H_2NCR^2(R^3)CO_2R^7$ (VII)

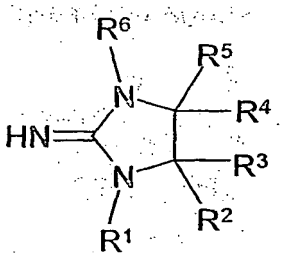
wherein R^2 and R^3 are as defined in claim 1 excluding where together with the attached carbon atom they form a carbonyl, thiocarbonyl or imino group, and R^7 is a leaving group, in the presence of a coupling agent to give an intermediate compound of formula (VIII):



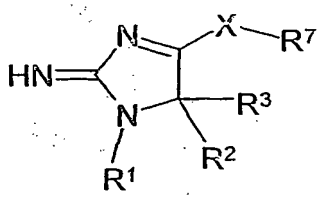
(VIII)

wherein the various symbols are as defined above, followed by cyclisation; or

d) where =Q is a formula (A) or (B), m is zero and the other symbols are as defined in claim 1, acylating the corresponding compound of formula (A^1) or (B^1):

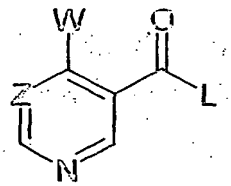


(A^1)



(B^1)

wherein the various symbols are as defined in claim 1, with a compound of formula (IX):

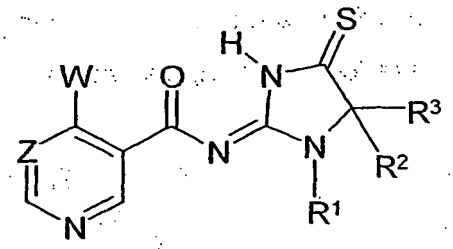


(IX)

wherein W and Z are as defined in claim 1 and L is a leaving group; or

e) where =Q is a formula (B), W, Z, R^1 and R^7 are as defined in claim 1, X is S, m is zero, and R^2 and R^3 are as defined in claim 1 excluding where together with the attached carbon atom they form a carbonyl or thiocarbonyl group, or an imino group

which is unsubstituted or substituted by $(C_1\text{-}C_6)$alkyl, $CO(C_1\text{-}C_6)$alkyl or R^{11a}, reacting a compound of formula (I) which is of formula (X):



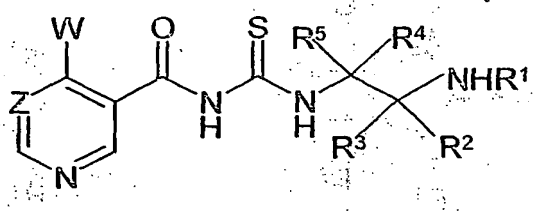
(X)

wherein W, Z, R1, R^2 and R^3 are as defined in claim 1, with a compound of formula (XI):

R^7L (XI)

wherein R^7 is as defined in claim 1 and L is a leaving group; or

f) where =Q is a formula (A), W, Z, R^1, R^2, R^3, R^4 and R^5 are as defined in claim 1, R^6 is hydrogen and m is zero, cyclising a compound of formula (XII):



(XII)

wherein W, Z, R^1, R^2, R^3, R^4 and R^5 are as defined in claim 1, in the presence of a base; or

g) where =Q is a formula (A), W, Z, R^1, R^2 and R^3 are as defined in claim 1, R^4 and R^5 together with the attached carbon atom form a carbonyl group, R^6 is hydrogen, and m is zero, oxidising and hydrolysing a compound of formula (I) wherein Q is a group of formula (B), X is S, and W, Z, R^1, R^2, R^3 and R^7 are as defined in claim 1, and m is zero; or

h) where =Q is a formula (B), W, Z, R^2, R^3 and R^7 are as defined in claim 1, R^1 is $CO(C_1\text{-}C_6)$alkyl which is unsubstituted or substituted by one or more R^8 groups, or is

COR^{11a} or CO-heterocyclyl, and m is zero, acylating the corresponding compound of formula (I) wherein R^1 is hydrogen, using a compound of formula (XIII):

$$R^1COL \qquad (XIII)$$

wherein L is a leaving group; or

i) where=Q is a group of formula (A), W, Z, R^2, R^3, R^4, R^5 and R^6 are as defined in claim 1, R^1 is $CO(C_1-C_6)$alkyl which is unsubstituted or substituted by one or more R^8 groups, or is COR^{11a} or CO-heterocyclyl, and m is zero, acylating the corresponding compound of formula (I) wherein R^1 is hydrogen, using a compound of formula (XIII) as defined above; or

j) where Q is as defined in claim 1, and m is 1, oxidising a corresponding compound in which m is 0; and

if desired, converting a resulting compound of formula (I) into a pesticidally acceptable salt thereof.

9. A pesticidal composition comprising a compound of formula (I) or a pesticidally acceptable salt thereof as defined in any one of claims 1 to 7, in association with a pesticidally acceptable diluent or carrier and/or surface active agent.

10. The pesticidal use of compounds of the formula (I) or their salts as claimed in any of claims 1 to 7, or of a pesticidal composition as claimed in claim 9.